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The Rueger Springs Creek Total Maximum Daily Load (TMDL) Of the Lake Walcott Watershed Management Plan (Lake Walcott TMDL)

By

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INFORMATION AT A GLANCE	
303(d) Waterbody	Snake River
Non 303(d) Waterbody	Rueger Springs Creek
Pollutants of Concern	Sediment, nutrients, bacteria
NPDES Permitted Facilities	ID-0001104 – American Falls Fish Hatchery
Approved TMDL	Lake Walcott TMDL

I. INTENT AND PURPOSE

The intent and purpose of the Rueger Springs Creek TMDL is to establish water quality load limits on sediment, nutrients and bacteria in Rueger Springs Creek. Rueger Springs Creek is not a 303(d) listed waterbody; but is generally described in the Lake Walcott Total Maximum Daily Load (i.e. Lake Walcott TMDL) as one of many "scattered springs … throughout the region" (Lay 2000 [p 15]). The receiving waterbody to Rueger Springs Creek is the Snake River, which is 303(d) listed. Consequently, the Rueger Springs Creek TMDL is necessary to protect the beneficial uses of the Snake River as part of the Lake Walcott TMDL and as allowed under IDAPA §58.01.02.054.02. The Rueger Springs Creek TMDL, therefore, is a tool for implementing State water quality standards and is based on the relationship between pollution sources and instream water quality conditions. The Rueger Springs Creek TMDL establishes the allowable loadings or other quantifiable parameters for Rueger Springs Creek and thereby provides the basis for the State to establish water quality-based controls. These controls should provide the pollution reduction necessary from Rueger Springs Creek to downstream water quality standards and beneficial uses of the Snake River.

II. IDENTIFICATION OF WATERBODY, POLLUTANTS OF CONCERN, POLLUTANT SOURCES, AND PRIORITY RANKING

Rueger Springs Creek is not specifically identified by Lay (2000) in the Lake Walcott TMDL. However, hydro-geologically it is a tributary to the Snake River. Its confluence is at River Mile 713.4 and identified as part of the "State Fish Hatchery" (Lay 2000 [p 172]) or as the "IDFG Fish Hatchery" (Lay 2000 [p 129 [Table 31]). Rueger Springs Creek is also an undesignated water body (relative to its beneficial uses) under IDAPA §58.01.02.150.11. However:

1. Rueger Springs is defined by the Idaho Department of Water Resources (IDWR) as a spring source in Section 31, Township 7S, Range 31E in Power County, Idaho and a tributary of the Snake River (IDWR 1998, IDWR 2006). Two water rights are associated with Rueger Springs and the IDFG American

Falls Fish Hatchery: (1) 35-00053 (fish propagation for 5.0 cfs and irrigation for 0.12 cfs) and (2) 35-02916 (fish propagation of 14.1 cfs). In both water rights Rueger Springs is identified as the spring source and a tributary to the Snake River.

2. Site visitation and ground truthing by DEQ personnel on March 10, 2006 indicated the following:

   a. As presently depicted in U. S. Geological Survey maps prior to 2000 and confirmed by the IDFG American Falls Fish Hatchery, Rueger Springs is actually located over the large pond-looking area (shown on the topographic maps) just west of the Snake River at approximately River Mile 713.5. See Appendix A. However, the pond is no longer in existence as shown on the USGS maps. Because of the hydro-geological connection to the Snake River, Rueger Springs discharges to the Snake River via surface conveyances as well as directly as groundwater to the Snake River.

   b. Surfaces discharges of Rueger Springs to the Snake River include:

      (1) An abandoned set of constructed fish propagation raceways that flow in a southeasterly direction to the Snake River. The Rueger Springs water from the springs-seeps-groundwater table outside of the main Rueger Springs "basin"; as well as upwelling through the raceway floors. It is estimated (based on historical knowledge and experience) by the IDFG American Falls Fish Hatchery personnel that the flow is approximately 50 gpm (or 0.1114 cfs) and is very seasonal in nature. DEQ estimates (based on cartographic linearization off of a USGS topographical map for the area) that the discharge to the Snake River is approximately at River Mile 713.6.

      (2) The pond (as depicted on USGS maps) has been buried. The water is collected underground via a spider web of perforated pipe. It is then transported underground to the newer raceways and the hatchery building. However, certain amount of groundwater is not necessarily collected in the underground spider web network; rather, it discharges directly into the channel. Hatchery personnel estimate this amount at 1.0 to 1.5 cfs and this estimate includes groundwater flow that emanates from outside the Rueger Springs "basin". DEQ estimates (based on cartographic linearization off of a USGS topographical map for the area) that the discharge to the Snake River from this constructed channel is at River Mile 713.4. Including the fish hatchery flow, the discharge to the Snake River averages 19.8 cfs, or a midpoint range value of 21.9 cfs with a minimum of 15.0 cfs and a maximum of 23.9 cfs based on the fish hatchery's discharge monitoring reports for the period of record (from January 1996 to December 2005; or N = 117 values).

3. As described in item 2b (above) Rueger Springs Creek discharges to the Snake River at two locations. Combining both flows, the discharge via the abandoned raceways amounts to an average of 0.56% of the total flow; and the through-the-fish-hatchery discharge amounts to an average of 99.44% of

the total flow. Effluent discharge from the IDFG American Falls Fish Hatchery is only through the more recent set of raceways and not through the abandoned raceways.

As defined in the Lake Walcott TMDL, Rueger Springs Creek discharges in Segment 1 of the Lake Walcott Snake River Reach (Lay 2000 [p 144]). The reach runs from American Falls to Massacre Rocks. Segment 1 is defined according to the mass balance model that was used in the Lake Walcott TMDL to establish the loading analysis (Lay 2000 [pp 143-144]). See Appendix A for a map of the Rueger Springs Creek Area. Additionally, Segment 1 is a free-flowing segment in the basalt gorge of the Snake River with a channel slope of approximately 9.6 feet per mile which is considered relatively steep (Lay 2000 [p 48]).

The pollutants of concern are based on the water quality impairments to the Snake River since the Snake River is the receiving waterbody. Rueger Springs Creek is located in the American Falls to Massacre Rocks Reach of the Snake River; which is approximately a 5-mile reach based on the River Mile Index of the Lake Walcott TMDL from American Falls to Eagle Rock Dam Site (Lay 2000 [pp 172, Appendix A]). The primary pollutant-of-concern is sediment because the 303(d) pollutant listing is primarily based on sediment. However, as described in the Lake Walcott TMDL (Lay 2000 [pp 46-47]), two primary sources of pollutants known to exist in the Lake Walcott subbasin are (1) sediment as the major pollutant and (2) phosphorus, bacteria and other pollutants as “other sources” (IDHW 1992). Therefore, for TMDL purposes as predicated on other nearby TMDLs (i.e. Upper Snake Rock TMDL), the pollutants of concern that will be considered in the Rueger Spring Creek TMDL will be sediment, nutrients and bacteria in order to meet the beneficial uses of the Snake River.

Within Segment 2 the major pollutant sources as defined in the Lake Walcott TMDL include non-irrigated cropland and irrigated cropland (Lay 2000 [p 47, Table 6]). These sources have been shown in other TMDLs to include sediment, nutrients and bacteria as primary pollutants. For purposes of the Rueger Springs Creek TMDL, the only pollutants that will be considered at this time are sediment (as total suspended solids or TSS), nutrients (as total phosphorus or TP) and bacteria (as *Escherichia coli* or *E. coli*).

The priority ranking for the Snake River (i.e. American Falls Dam to Massacre Rocks Reach,) is high priority and is presently under implementation planning as a post-TMDL component in the Lake Walcott TMDL process. In order for this high priority stream to meet its beneficial uses it is necessary for all tributaries (whether defined as 303(d) or not) that discharge into the high priority stream to undergo the TMDL process (as informational TMDLs) in order for the high priority stream (i.e. the Snake River) to meets its beneficial uses as defined under IDAPA §58.01.02.054.02. In addition and as defined under IDAPA §58.01.02.054.04, certain high priority provisions apply and include the following once the TMDL is completed:

(1) Until a TMDL or equivalent process is completed for a high priority water quality limited water body, new or increased discharge of pollutants which have caused the water quality limited listing may be allowed if interim changes, such as pollutant trading, or some other approach for the pollutant(s) of concern are implemented and the total load remains constant or decreases within the watershed. In this situation, the Lake Walcott TMDL was completed in 2000 and approved by EPA (Lay 2000). The information contained in the Lake Walcott TMDL states that the fish hatchery on Rueger Springs Creek was in operation at the time the TMDL was developed, finalized and approved (Lay 2000 [p 129, Table 31, as an existing point

source]) and was assigned a WLA of 0.256 ton/year for TSS (Lay 2000 [p 145, Table 45]) or 512 lb/day TSS without taking into account the design flow of the facility. Since then the development of EPA's Idaho General Aquaculture Permit has occurred and the facility operation requires WLAs for TP and TSS that are more in line with its operational nature; thus making it necessary to more formally develop the Rueger Springs Creek TMDL as a component of the Lake Walcott TMDL. As such, the TMDL process for the Snake River (as the water quality limited water body) in the Lake Walcott Subbasin is still in effect. Consequently, the Rueger Springs Creek TMDL is only an additional component of that same process that more fully addresses the sources of pollutants that eventually discharge (through Rueger Springs Creek) into the Snake River.

(2) Once the TMDL or equivalent process is completed (as has occurred with the Lake Walcott TMDL), any new or increased discharge of causative pollutants (as in the case of the Rueger Springs Creek fish facility) will be allowed only if consistent with the approved TMDL (i.e. the Lake Walcott TMDL). Therefore, the Rueger Springs Creek TMDL meets the overall intent of the Lake Walcott TMDL in defining consistency to pollutant sources in meeting the loading capacity of Rueger Springs Creek in order to meet the loading capacity of the Snake River as the high priority stream under the Lake Walcott TMDL.

(3) Nothing in the development and implementation of the Rueger Springs Creek TMDL (as a component of the Lake Walcott TMDL) is intended or shall be interpreted as requiring best management practices for agricultural operations which are not adopted on a voluntary basis.

III. DESCRIPTION OF THE APPLICABLE WATER QUALITY STANDARDS AND NUMERIC WATER QUALITY TARGET

The American Falls to Massacre Rocks Reach of the Snake River is designated for primary contact recreation, secondary contact recreation, cold water aquatic life, drinking water supply, and agricultural water supply. See Lay 2000 (p 54 [Table 9]). As previously noted in Section II, this is defined as Segment 1 of the Lake Walcott Snake River Reach in the Lake Walcott TMDL.

Segment 1 is listed in the 2002 Integrated Report (IDEQ 2005 [p 326]) and has a pollutant listing as Unknown. The 1998 303(d) list shows Segment 1 (American Falls to Eagle Rock) initially listed in 1996 for sediment. Table 1 shows the National Assessment Database (EPA 2002) for the Lake Walcott Watershed. It shows the assessment units (AUs) catalog number and water quality status of the Snake River reach for Segment 1 of Lake Walcott.

Table 1. Lake Walcott Segment 1 Reach Assessment Units and Water Quality Status

SEGMENT 1	SNAKE RIVER SEGMENT 1 ASSESSMENT UNIT(S)	WATER QUALITY STATUS PER AU
American Falls Dam to Rock Creek	ID17040209SK001_02,07,03	I, I, NA
AU = Assessment Unit. ID = Idaho. I = Impaired. NA = Not Assessed.		

The numeric water quality standards imposed that will be used in the Rueger Springs Creek TMDL are based on the assumptions promulgated by the Lake Walcott TMDL. These standards are described as follows:

1. Sediment. Water quality in this reach of the Snake River has been reported to have total suspended sediment (TSS) at 19.0 mg/L (mean); but has also been shown to have maximum concentrations of 156.0 mg/L TSS (Lay 2000 [p 67, Table 12]). The recommended instream water quality target for TSS is 25 mg/L (average monthly) in the Snake River and 50 mg/L (average monthly) in the tributaries (Lay 2000 [p 138]). The loading capacity for sediment (as TSS) for the Snake River reach is 318 ton/day (Lay 2000 [p 145, Table 45]). Of this total loading capacity, 28.582 ton/day is allocated as load allocation for nonpoint sources; that represents 8.99% of the total loading capacity. For point sources, the wasteload allocation component is represented by 0.418 ton/day or 0.13% of the total loading capacity.

2. Nutrients. Water quality in this reach of the Snake River has been reported to have total phosphorus (TP) at 0.064 mg/L (mean); but has also been shown to have a maximum concentration of 0.660 mg/L TP (Lay 2000 [p 67, Table 12]). The recommended instream water quality target for TP is 0.080 mg/L TP in the Milner Pool (Lay 2000 [p 143]) but no loading capacity for TP is set in the Snake River reach. Segment 1 also does not have a nutrient limitation for TP as defined in the Lake Walcott TMDL. Therefore, the application of IDAPA 58.01.02.051.01 is applied in that the existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Since a TMDL for nutrients (TP) was not defined in the Lake Walcott TMDL, the application of the 0.080 mg/L TP instream concentration as a conservative approach is applied in order to meet the Milner Pool as the receiving waterbody in the Snake River from this upstream reach of the Snake River. As a consequence, the Rueger Springs Creek instream concentration is set at a concentration of 0.080 mg/L TP in order to meet the same instream concentration in the Snake River.

3. Bacteria. Water quality in this reach of the Snake River has been reported to have fecal coliform bacteria at 73 cfu/100 mL (mean); but has also been shown to have maximum concentrations of 3,300 cful/100 mL (Lay 2000 [p 67, Table 12]). Bacteria as *Escherichia coli* (*E. coli*) were not assessed in the Lake Walcott TMDL because at the time the Idaho IDAPA rules and regulations had provisions only for fecal coliform as a surrogate for *E. coli*. Since then, the State Legislature has approved the *E. coli* water quality standard (IDAPA 58.01.02.251.01) for primary recreational standard as 406 cfu/100 mL instantaneous sample and 126 cfu/100 mL geometric mean. It

would appear from the values reported in the Lake Walcott TMDL that fecal coliform bacteria exceeded the numeric standards under certain conditions. From a conservation perspective, it can only be assumed that since fecal coliform bacterium was a surrogate for *E. coli*, the *E. coli* criteria was also exceeded under certain circumstances. Therefore, the application of the primary contact recreation geometric mean (126 cfu/100 mL) will be applied on Rueger Springs Creek to meet the beneficial uses of the Snake River.

IV. LOADING CAPACITY - LINKING WATER QUALITY AND POLLUTANT SOURCES

The loading capacity (LC) is the greatest amount of loading that a water can receive without violating water quality standards (40 CFR 132.2 and IDAPA 58.01.02.003.51). In the case of Rueger Springs Creek, the LC is dictated in great measure by the LC of the Snake River as the receiving 303(d) listed waterbody. In order for the Snake River to meet water quality standards, it is imperative that the tributaries to the Snake River meet water quality standards as well. Otherwise, attainment of water quality standards (and beneficial uses) cannot be achieved in the Snake River.

In order to determine the LC for Rueger Springs Creek, it is necessary to have an estimate of the flow from the creek prior to discharge into the Snake River. However, Rueger Springs Creek average flow is unknown and is defined as a data gap. However, as previously described in Section II, the flow from Rueger Springs Creek can be estimated based on the effluent flow discharge from the IDFG American Falls Fish Hatchery and the estimate flow from groundwater that discharges into Rueger Springs Creek. Both these flows combined would provide a preliminary estimate of the flow from Rueger Springs Creek. Therefore,

1. The IDFG American Falls Fish Hatchery (based on the discharge monitoring reports for the period of record from January 1996 to December 2005, or N = 117 values) has an average flow of 19.8 cfs. The coefficient of variation (CV) for the repeated monthly discharge values is 0.090 (or 9.0%) as a measure of dispersion of the discharge flow distribution. Relatively speaking, a CV value less than 10% is considered to have very low variability in its flow measurements. The standard deviation is ± 1.78 cfs; therefore, the flow (generally speaking) falls in the range of 19.8 ± 1.78 cfs; or more robustly a flow of 19.8 + 1.78 = 21.58 cfs or 21.6 cfs

2. The underground flow is conservatively estimated to be 1.0 - 1.5 cfs, but the personnel at the IDFG American Falls Fish Hatchery are uncertain if this estimate is remotely accurate. Therefore, DEQ applied a more conservative estimate of 2.0 cfs based on the provision that the higher 1.5 cfs estimate was rounded to 2.0 cfs.

3. Therefore, the Rueger Springs Creek estimate is as follows:

IDFG American Falls Fish Hatchery:	21.6 cfs
Groundwater into Rueger Springs Creek:	2.0 cfs
Overall Total Discharge Estimate:	23.6 cfs = 24.0 cfs

The 23.6 cfs flow estimate approximates the maximum value of 23.9 cfs from the IDFG American Falls Fish Hatchery. Therefore, DEQ applied the 24.0 cfs rounded value as a conservative approach to the overall flow from Rueger Springs Creek. IDEQ-TFRO intends to fill in this data gap by providing some

level of flow monitoring in the total flow of Rueger Springs Creek prior to the next iteration of the Lake Walcott TMDL.

Based on the Lake Walcott TMDL provisions for instream water quality standards (or targets), the Rueger Springs Creek LC is defined as follows (as previously described in Section III):

1. Sediment (as TSS): 50 mg/L (average monthly) in the tributaries. Therefore,

   TSS LC = 50 mg/L TSS x 24.0 cfs x 5.4 = 6,480.0 lb/day TSS LC

2. Nutrients (as TP): The recommended instream water quality target for TP is 0.080 mg/L TP as previously described in Section III. Therefore,

   TP LC = 0.080 mg/L TP x 24.0 cfs x 5.4 = 10.37 lb/day TP LC

3. Bacteria (as *E. coli*): The primary recreational standard is 406 cfu/100 mL for an instantaneous sample and 126 cfu/100 mL for a geometric mean of five (5) samples taken over a 30-day period at equal intervals between samples. Therefore,

   126 cfu/100 mL *E. coli* x 24.0 cfs x 0.02445 = 73.9 cfu^9/day *E. coli* LC

The current or existing load for Rueger Springs Creek is uncertain because actual monitoring that incorporates a characterization of the point source from the nonpoint source has not been determined. However, the existing water quality condition of the creek may be estimated based on the IDFG American Falls Fish Hatchery discharge monitoring reports for the period of record (January 1996 through December 2005) is shown in Table 2.

Table 2. Effluent water quality values for the IDFG American Falls Fish Hatchery

WATER QUALITY STATISTIC	TSS, mg/L INFLUENT	EFFUENT	NET	TP, mg/L INFLUENT	EFFUENT	NET
N	27	51	51	28	28	28
Minimum	< 1.0	< 1.0	< 1.0	0.012	0.012	0.002
Maximum	< 1.0	5.4	5.4	0.024	0.053	0.029
Mean	< 1.0	< 1.0	0.5	0.017	0.029	0.012
Median	< 1.0	< 1.0	0.5	0.017	0.029	0.012
Midpoint Value	< 1.0	3.2	2.9	0.021	0.041	0.020
Standard Deviation	0.000	1.077	1.084	0.002	0.007	0.006
Coefficient of Variation	0.000	1.095	2.383	0.126	0.233	0.517

TSS = Total Suspended Solids. TP = Total Phosphorus. N = the number of values in the data set for the period of record (January 1996 through December 2005). In the data sets for the determination of the mean and median, the values are indeed similar. *E. coli* values were not sampled in the effluent water since cold blooded fish do not generate these in their intestines.

The influent values represented in Table 2 describe the water quality for TSS and TP of Rueger Springs Creek prior to combining with the effluent discharge from the IDFG American Falls Fish Hatchery. Under the worse case scenario (maximum concentration values), the TSS for Rueger Springs Creek is < 1.0 mg/L and TP is < 0.024 mg/L. The addition of the effluent discharge from the fish hatchery increments (on a maximum basis) the water quality to 5.4 mg/L TSS and 0.053 mg/L TP. Based on the Lake Walcott TMDL provisions for instream water quality standards (or targets), the TSS is maintained below the 50.0 mg/L and the TP is maintained below 0.080 mg/L. It is highly unlikely that the influence from additional water volume from groundwater sources would create a water quality impairment to the system above the water quality targets of the Lake Walcott TMDL.

V. WASTELOAD ALLOCATIONS (WLAs)

As defined in IDAPA 58.01.02.003.100, the wasteload allocation (WLA) is the portion of a receiving water's LC that is allocated to one of its existing or future point sources of pollution. The federal definition is similar under 40 CFR 132.2 but also appends the following, "In the absence of a TMDL approved by EPA pursuant to 40 CFR 130.7 or an assessment and remediation plan developed and approved in accordance with procedure 3.A of appendix F of this part, a WLA is the allocation for an individual point source, that ensures that the level of water quality to be achieved by the point source is derived from and complies with all applicable water quality standards." Since Rueger Springs Creek is not currently on the 303(d) list of the federal Clean Water Act, the application of the water quality standards is based on achieving the beneficial uses of the Snake River (which is 303(d) listed). Therefore, Rueger Springs Creek must meet the water quality standard of the Snake River by having its own LC for that express purpose.

Only one (1) point source is known to exist on Rueger Springs Creek. It is the IDFG American Falls Fish Hatchery Facility (NPDES No. ID-13003). The WLAs for this facility is based on the discharge monitoring records for the period of record from January 1996 to December 2005 (or N = 117 for flow).

1. <u>TSS WLA</u>: The TSS limitation for raceway effluent discharges is 5.0 mg/L Net TSS. This limitation has foundation and precedence as an NPDES permit limit in the Mid-Snake fish hatcheries of the Upper Snake Rock TMDL (Buhidar, 1997, Buhidar 1999, Buhidar 2000, and Buhidar 2005). IDEQ-TFRO concludes that the application of this limitation on the Rueger Springs Creek facility is consistent and provides a rational basis for use of this provision. Therefore,

   IDFG Facility: 5.0 mg/L TSS x 19.8 cfs (mean) x 5.4 = 534.6 lb/day TSS

   Based on the discharge monitoring reports for the period of record the raceway average TSS net load was exceeded once in 51 sampling months (or 1.96% of the time). There is no offline settling pond associated with this facility.

2. <u>TP WLA</u>: The basis for the TP WLA is premised on a concentration target that will meet the water quality standard for the Snake River (as the receiving waterbody). As discussed in Section IV, in order to follow precedence and maintain consistency and to provide a rational basis for such precedence and consistency, the use of the Upper Snake Rock TMDL approach (not the 0.075 mg/L TP instream target in the Middle Snake River) for aquaculture facilities was applied here (Buhidar, 1997, Buhidar 1999, Buhidar 2000, and Buhidar 2005) but rather as defined in the Lake Walcott TMDL for the Snake River. Therefore, a concentration-based target of 0.080 mg/L TP was used to set the TP limitations for both facilities together; based on the 0.080 mg/L TP in the Snake River as previously discussed in Section IV; and based on a flow rate of 19.8 cfs as an average flow through the facility. Therefore,

   TP WLA: 0.080 mg/L TP x 19.8 cfs x 5.4 = 8.55 lb/day TP

3. *E. coli* WLA: As stipulated in Buhidar and Sharpnack (2003): "Relative to the aquaculture industry in the Upper Snake Rock subbasin, the fecal coliform or *E. coli* criteria are not indigenous to cold water fish hatcheries or warm water fish hatcheries. Total coliform bacteria are a collection of relatively harmless microorganisms that live in man and warm- and cold-blooded animals. They aid in the digestion of food. A specific subgroup of this collection is the fecal coliform bacteria, the most common member being *E. coli*. Fecal coliform bacteria and *E. coli* are generated in the intestines of man or warm-blooded animals. Fish, whether raised in cold water or warm water, are cold-blooded animals and do not generate fecal coliform bacteria or *E. coli* in their intestines." Consequently, no limitations are imposed for *E. coli* on the fish hatcheries of Fall Creel. Their WLA for *E. coli* is zero.

No information was available form the discharge monitoring reports for the *E. coli* load for the period of record. But it is assumed under the scenario described in the previous paragraph that the facility does not discharge *E. coli* as a component of their effluent. Therefore, a WLA of zero is applied.

VI. LOAD ALLOCATIONS (LAs)

As defined in IDAPA 58.01.02.003.50, the load allocation (LA) is the portion of a receiving water's LC that is attributed either to one (1) of its existing or future nonpoint sources of pollution or to natural background sources. The federal definition is similar under 40 CFR 132.2 but also appends the following, "Nonpoint sources include: in-place contaminants, direct wet and dry deposition, groundwater inflow, and overland runoff."

In order to mathematically define the LA for Rueger Springs Creek, the starting point is with the LC. The LC, as previously described (Section IV) is the greatest amount of loading that water can receive without violating water quality standards. By mathematical definition, the components that make up the LC cannot be greater than the LC itself. Consequently, the LA for nonpoint sources combined with the WLA for point sources must be less than the LC. To these components must be added the definition of "available load" (AL) which represents the load that is actually available for allocation between point sources and nonpoint sources after the uncertainty component is considered. That uncertainty component is best defined as the margin of safety (MOS) which is further described in Section VII. But essentially, the available load is the LC minus the MOS. Therefore,

AL = LA + WLA = LC - MOS

LA = LC - MOS - WLA = LC - (MOS + WLA)

TSS LA: 6,480.0 lb/day TSS - (648.0 lb/day + 534.6 lb/day) = 5,297.4 lb/day TSS

TP LA: 10.37 lb/day TP - (1.04 lb/day + 8.55 lb/day) = 0.78 lb/day TP

E. coli LA: 73.9 cfu^9/day *E. coli* - (7.4 cfu^9/day + 0.0 cfu^9/day) = 66.5 cfu^9/day *E.coli*

Within the structure of the Rueger Springs Creek TMDL, the LA was further divided into the following three (3) general categories: (1) permitted nonpoint source facilities; (2) Ag, Graze, Private, Corridor; and (3) stormwater construction-type facilities.

1. The first general category deals with permitted nonpoint source facilities associated with the Federal Energy Regulatory Commission (FERC) permitted hydropower facilities; all land application facilities (LAFs) that may or may not require a permit from the State; and all confined feeding operations (CFOs) that may or may not require an NPDES permit from EPA for a 24-hour, 25 year storm event.

2. The second general category deals with all agricultural lands (inclusive of irrigated and non irrigated lands farmlands); grazing on public lands and state lands; private land ownership that includes all nonpoint source activities; and those activities of sort that are more closely related to the Rueger Springs Creek stream corridor that are not necessarily associated with the other sub components of this second general category.

3. The third general category deals with all construction-type activities that may or may require a general permit (from EPA) that may have a direct impact to Rueger Springs Creek and which require erosion and sediment controls. This third category utilizes a 2% reserve from the overall nonpoint source category and reverts back to this category once the construction activity is finalized. Precedence and justification for this 2% approach may be shown in Buhidar (2005). Calculations for this category are summarized as follows:

    Construction Activities = Pollutant LA x 2%

    <u>TSS Construction Activities</u>: 5,297.4 lb/day x 2% = 105.9 lb/day TSS

    <u>TP Construction Activities</u>: 0.78 lb/day x 2% = 0.02 lb/day TP

    <u>*E. coli* Construction Activities</u>: 66.5 cfu^9/day x 2% = 1.3 cfu^9/day *E. coli*

In terms of future growth for nonpoint sources, no specific allocation was set aside for this, therefore the allocation is zero. However, as a general consideration, it is noted that future growth of the Rueger Springs Creek drainage that incorporate a landuse change (such as from agricultural or grazing lands to subdivisions) may occur. Such changes or any similar to it will still be considered a part of the overall nonpoint source category that is associated with the LA and must demonstrate compliance with the overall water quality goals of the Rueger Springs Creek TMDL in order to be in compliance with the TMDL process.

VII. MARGIN OF SAFETY (MOS)

A 10% margin of safety (MOS) was applied on all pollutants-of-concern. As defined under U.S. Code Title 33, Chapter 26, Sub Chapter III, §1313 (d) (1) C, “Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.” This same definition is described in IDAPA §58.01.02.003.93 as a component of a TMDL. Therefore, the 10% MOS is to account for any lack of knowledge concerning the relationship between effluent limitations and water quality. As such:

1. <u>TSS MOS</u>: 10% of the LC. Therefore,

6,480.0 lb/day TSS LC x 10% = 648.0 lb/day TSS MOS

2. TP MOS: 10% of the LC. Therefore,

10.37 lb/day TP LC x 10% = 1.04 lb/day TP MOS

3. *E. coli* MOS: 10% of the LC. Therefore,

73.9 cfu^9/day *E. coli* LC x 10% = 7.4 cfu^9/day *E. coli* MOS

VIII. SEASONAL VARIATION

Seasonal variation is a component of a TMDL as defined in IDAPA §58.01.02.003.93 and U.S. Code Title 33, Chapter 26, Sub Chapter III, §1313 (d) (1) (C). The application of a seasonal component into the TMDL for Rueger Springs Creek was not considered because little information existed to allow for this. Therefore, the seasonal variation is zero. However, it is reasonable to assume that future iterations of the Rueger Springs Creek TMDL may require seasonal considerations and therefore are deferred until such time as more information is provided to justify this.

IX. OVERALL TMDL TABLE BASED ON THE LC FOR FALL CREEK

Table 3 summarizes Sections IV, V, VI, VII and VII as previously noted. The overall TMDL table (Table 3) is based on the water quality targets set for Rueger Springs Creek on instream water quality targets for TSS (50.0 mg/L), TP (0.080 mg/L) and E. coli (406 cfu/100 mL). The flow provisions are based on average flows of 24.0 cfs for Rueger Springs Creek.

Table 3. Rueger Springs Creek Overall TMDL Table

TMDL COMPONENTS	TSS, lb/day	TP, lb/day	*E. coli*, cfu^9/day
NONPOINT SOURCES			
FERC, LAFs, CFOs	0.0	0.0	0.0
Ag, Graze, Private, Corridor	5,191.5	0.76	65.2
Stormwater - Construction - 2%	105.9	0.02	1.3
NPDES PERMITTED POINT SOURCES			
IDFG American Falls FH	534.6	8.55	0.0
Margin of Safety - 10%	648.0	1.04	7.4
Loading Capacity	6,480.0	10.37	73.9

E. coli = *Escherichia coli*. TSS = Total Suspended Solids. TP = Total Phosphorus. WLA = Wasteload Allocation for an NPDES permitted point source facility. Seasonal variation is not a component in the Fall Creek TMDL at this time. FERC = Federal Energy Regulatory Commission permitted hydropower facilities. LAFs = Land Application Facilities. CFOs = Confined Feeding Operations like dairies and feedlots of all sizes. Ag = All agricultural cropland and farmland combined. Graze = All grazing lands. Private = All privately owned lands. Corridor = All stream corridor components associated with Rueger Springs Creek. FH = Fish Hatchery.

Relative to TSS, the overall nonpoint source category (5,297.4 lb/day TSS) represents 81.75% of the TSS LC. The point source category (534.6 lb/day TSS) represents 8.25% of the TSS LC. The remaining 10% is attributable to the TSS MOS.

Relative to TP, the overall nonpoint source category (0.78 lb/day TP) represents 7.52% of the TP LC. The point source category (8.55 lb/day TP) represents 82.45% of the TP LC. The remaining 10% is attributable to the TP MOS.

Relative to *E. coli*, the overall nonpoint source category (66.5 cfu^9/day *E. coli*) represents 90.0% of the *E. coli* LC. The point source category (0.0 cfu^9/day *E. coli*) represents 0.0% of the *E. coli* LC. The remaining 10% is attributable to the *E. coli* MOS.

X. REASONABLE ASSURANCES

Providing reasonable assurance that point sources and nonpoint sources will meet the LC of Rueger Springs Creek is a necessary requirement of the Rueger Springs Creek TMDL in order to meet the beneficial uses of the Snake River. By determining the LC for Rueger Springs Creek (for TSS, TP and *E. coli*) and by allocating allowable limits within the confines of the LC provides reasonable assurance that the LC can be met by both the point sources and the nonpoint sources (assuming both sources meet their imposed targets). Therefore, reasonable assurance will provided through the following:

1. Point Sources. Point sources (fish hatcheries) will receive WLAs that are below and within the LC of the Rueger Springs Creek waterbody; and are specifically set up to meet the beneficial uses of the Snake River. This will be accomplished through the NPDES permitting process since TP makes up 82.45% of the TP LC in the point source category.

2. Nonpoint Sources. Nonpoint sources will receive LAs that are below and within the LC of the Rueger Springs Creek waterbody; and are specifically set up to meet the beneficial uses of the Snake River. IDEQ-TFRO in conjunction with the land management agencies will coordinate with public and private land ownerships to incorporate water quality cleanup projects specifically targeted to reducing erosion and sediment sources since TSS makes up 81.75% of the TSS LC in the nonpoint source category. Associated with this is 90.0% of the *E. coli* that is attributable to the nonpoint source category.

In the case of Rueger Springs Creek, both the point source and nonpoint source industries will provide management strategies that support reasonable assurances in meeting the water quality standards and beneficial uses of Rueger Springs Creek and the Snake River jointly.

XI. MONITORING PLAN TO TRACK TMDL EFFECTIVENESS

In addition to monitoring that will be conducted by the NPDES permitted facilities, IDEQ-TFRO will monitor (depending on available resources) Rueger Springs Creek, especially as it pertains to any water quality cleanup projects (as referenced in Section XII). Monitoring will include the flowing: (1) headwaters reach if applicable, and (2) just above the point of discharge into the Snake River. As previously noted, flow monitoring of the Rueger Springs Creek waterbody will be an important component in this monitoring scheme.

In addition, the Beneficial Use Reconnaissance Program (BURP) will be utilized to ascertain the status of beneficial uses on Rueger Springs Creek as defined by the protocols of BURP.

Other monitoring will be assessed that involves private landowners, public land management agencies, and the Idaho Soil Conservation Commission and the associated Soil and/or Water Conservation District. Erosion assessments for nonpoint source considerations will also be determined as monitoring is further developed over the next 5 years.

XII. IMPLEMENTATION PLANNING

As part of the overall Lake Walcott TMDL implementation planning process, the Rueger Creek TMDL is a part of that process. IDEQ-TFRO is presently in the process of assessing potential water quality cleanup projects on Rueger Springs Creek with the assistance of the Lake Walcott Watershed Advisory Group and the associated land management agencies.

XIII. PUBLIC PARTICIPATION

Prior to finalization of the draft Rueger Springs Creek TMDL, IDEQ-TFRO visited the Rueger Springs Creek watershed and the NPDES permitted facility to gather the necessary information for establishing the TMDL. Consistent with 40 CFR §130.7(c)(1)(ii), IDEQ-TFRO will conduct a public review process (i.e. 30 days) to receive comments from the Lake Walcott subbasin interests; as well as from the Rueger Springs Creek watershed interests. As defined in 40 CFR §130.7(d)(2), a published notice seeking public comment will occur prior to final submission to EPA for final review and approval.

XIV. SUBMITTAL LETTER

As defined by EPA and IDEQ-State Office as part of Section 303(d) of the Clean Water Act, IDEQ-TFRO will prepare a submittal letter for final review and approval by EPA via IDEQ-State Office of the Rueger Springs Creek TMDL.

XV. ADMINISTRATIVE RECORD

The administrative record is not a necessary part of the submittal to EPA. However, IDEQ-TFRO has prepared and will maintain an administrative record pertinent to the development of the Rueger Springs Creek TMDL; and in particular any implementation water quality cleanup projects as a result of the overall Lake Walcott TMDL. Components in the administrative record will include all documents that support the calculations, allocations and establishment of the Rueger Springs Creek TMDL to meet the beneficial uses of the Snake River; including any data, analyses, or scientific/technical references that were used, record of correspondence with stakeholders and EPA, responses to public comments, and other supporting materials.

XVI. REFERENCES

Buhidar B. B. 1997. The Middle Snake River Watershed Management Plan. Phase 1 TMDL Total Phosphorus. March 25, 1997. Twin Falls (ID): IDEQ-TFRO.

Buhidar B. B. 1999. The Upper Snake Rock Watershed Management Plan. December 20, 1999. Twin Falls (ID): IDEQ-TFRO.

Buhidar B. B. 2000. TMDL Executive Summary - Upper Snake/Rock Subbasin TMDL. July 2000. Twin Falls (ID): IDEQ-TFRO.

Buhidar B. B. 2005. The Upper Snake Rock TMDL Modification. July 22, 2005. Twin Falls (ID): IDEQ-TFRO.

Buhidar B. B. and Sharpnack R. 2003. Staff Analysis: a determination of reasonable assurance using localized impacts and accumulative impacts assessments on the proposed aquaculture industry wasteload allocations for the Middle Snake River and its tributaries. January 20, 2003. Twin Falls (ID): IDEQ-TFRO.

Idaho Department of Environmental Quality (IDEQ). 2005. Principles and Policies for the 2002 INTEGRATED (303(d)/305(b)) REPORT. September 30, 2005. Boise (ID): IDEQ-State Office.

[IDHW] Idaho Department of Health and Welfare. 1992. The 1992 Idaho Water Quality Status Report. Boise, Idaho.

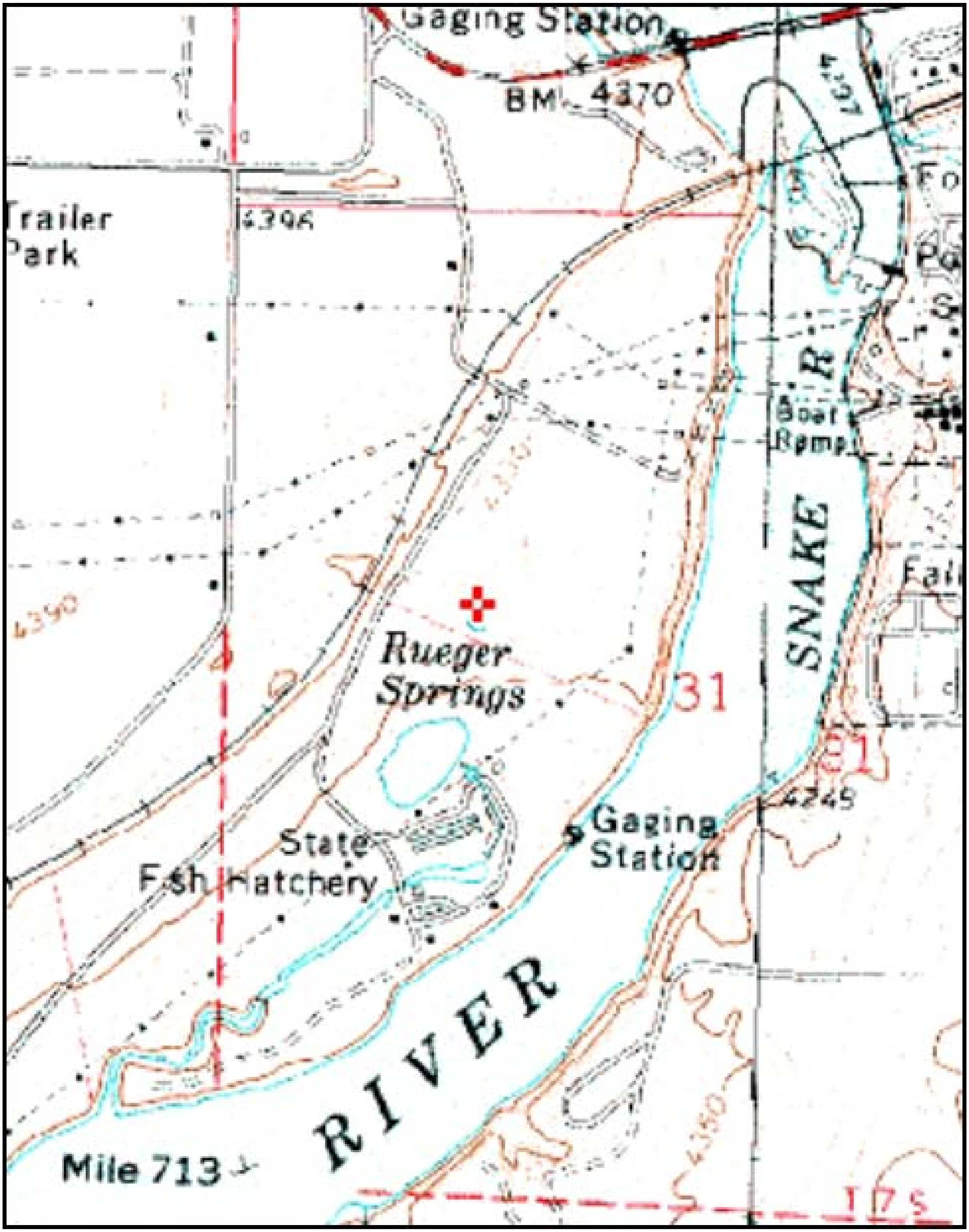
Idaho Department of Water Resources (IDWR). 1998. Idaho Department of Water Resources Adjudication Claims Proof Reading Report. July 15, 1998. Water Right R35-00053: Main Use of this water is fish propagation. Internet Website: http://www.idwr.state.id.us/apps/ExtSearch/SearchWRAJ.asp . Boise (ID): IDWR.

IDWR. 2006. IDWR Water Right and Adjudication Search. Internet Website: http://www.idwr.state.id.us/apps/ExtSearch/SearchWRAJ.asp . Boise (ID): IDWR.

U. S. Environmental Protection Agency (EPA). 2002. National Assessment Database. URL: http://iaspub.epa.gov/tmdl/w305b_report_v2.huc . Last Updated June 10, 2006.

Lay C. H. 2000. The Lake Walcott Subbasin Assessment, Total Maximum Daily Load, and Implementation Plan. Twin Falls (ID): IDEQ-TFRO.

APPENDIX A. RUEGER SPRINGS CREEK AREA.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Fish Hatchery
Gaging
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4245
RIVER
Mile 713
4390
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